

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

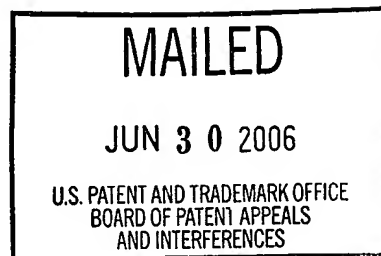
UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

Ex parte WILLIBRORD A. GROTEN

Appeal No. 2006-1551  
Application No. 10/015,863

ON BRIEF



Before GARRIS, WARREN and TIMM, Administrative Patent Judges.

GARRIS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal which involves claims 11-16.

The subject matter on appeal relates to a process for reducing the organic sulfur content of a full boiling range cracked naphtha stream which comprises: separating the stream into three fractions comprising light, intermediate and heavy fractions with differing boiling temperature ranges; subjecting the heavy fraction to hydrodesulfurization in a first hydrodesulfurization reactor then combining the effluent therefrom with the intermediate fraction; and subjecting the

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combined stream to hydrodesulfurization in a second hydrodesulfurization reactor. Further details of this appealed subject matter are set forth in representative independent claim 11 which reads as follows:

11. A process for reducing the organic sulfur content of a full boiling range cracked naphtha stream containing olefins, diolefins, mercaptans, thiophenes, and other organic sulfur compounds, comprising the steps of:

(a) separating the full boiling range cracked naphtha stream into three fractions comprising a light cracked naphtha fraction boiling in the range of C<sub>5</sub> to about 150°F, an intermediate cracked naphtha fraction boiling in the range of about 150 to about 250°F and a heavy cracked naphtha boiling in the range of about 250 to 450°F;

(b) subjecting the heavy cracked naphtha to hydrodesulfurization in a first hydrodesulfurization reactor containing a hydrodesulfurization catalyst;

(c) combining the effluent from the first hydrodesulfurization reactor with the intermediate cracked naphtha and subjecting the combined stream to hydrodesulfurization in a second hydrodesulfurization reactor and

(d) subjecting said light cracked naphtha to a wet caustic wash after said fractionation wherein substantially all of the mercaptans contained therein are converted to sulfides.

The reference set forth below is relied upon by the examiner as evidence of obviousness:

Fletcher et al. (Fletcher)	5,290,427	Mar. 1, 1994
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All of the claims on appeal are rejected under 35 U.S.C. § 103(a) as being unpatentable over Fletcher.<sup>1</sup>

We refer to the brief and reply brief and to the answer for a complete discussion of the opposing viewpoints expressed by the appellant and by the examiner concerning the above noted rejection.

#### OPINION

For the reasons expressed by the examiner and below, we will sustain this rejection.

As noted by the examiner, the boiling temperature ranges for the three naphtha fractions defined by the independent claim on appeal differ from the three temperature ranges explicitly disclosed by Fletcher in figure 1. More specifically, while the respective temperature ranges claimed by the appellant and disclosed by patentee overlap, they do not coincide as is readily apparent from the comparison of these ranges shown on page 2 of the reply brief. According to the examiner, "[i]t . . . would have been obvious to one having ordinary skill in the art at the

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<sup>1</sup>The appealed claims have not been separately argued in the manner required by 37 CFR § 41.37(c)(1)(vii)(2004). Indeed, the appellant expressly states that "[t]he claims are considered together" (brief, page 4). As a consequence, we will focus on claim 11, the sole independent claim on appeal, in considering the propriety of the examiner's rejection.

time the invention was made to have modified the process of Fletcher by utilizing the claimed fractions with the claimed boiling ranges because any boiling range fractions will be effectively treated as long as the heavier fraction is introduced at the inlet of the reactor" (answer, page 4).

In support of his patentability position, the appellant argues on page 2 of the reply brief that the here claimed temperature ranges yield results not obtainable with the temperature ranges of Fletcher (i.e., the temperature ranges explicitly disclosed in figure 1 of the patent). It is, of course, expected that different parameter conditions may yield different results. However, this consequence relates to the issue of claim 11 novelty which the examiner has conceded. On the other hand, the appellant's argument has questionable relevance to the nonobviousness issue raised by the examiner's rejection.

Concerning this last mentioned issue, Fletcher clearly teaches that the temperature ranges of figure 1 are merely illustrative (e.g., see lines 36-41 in column 9). Indeed, patentee expressly and repeatedly teaches that cut points between his fractions will depend on the boiling range of the original crack feed as well as the sulfur distribution in the feed (e.g.,

see lines 4-7 in column 11 and lines 38-41 in column 4).  
Significantly, Fletcher additionally teaches that "lower cut points will typically be necessary for lower product sulfur specifications" (lines 41-43 in column 4). It is also significant that Fletcher, like appellant, discloses practicing his process with a full range naphtha feed (e.g., see lines 6-14 in column 4) in such a manner as to remove sulfur while at the same time minimizing the saturation of olefins which contribute to the octane of the final gasoline product (e.g., see the paragraph bridging columns 7-9 and lines 14-32 in column 10).<sup>2</sup>

In light of these teachings, we agree with the examiner that an artisan would have found it obvious to develop workable boiling temperature ranges for the three naphtha fractions treated in Fletcher's disclosed process which would correspond to the ranges defined by claim 11 when providing this process with a full range naphtha feed with the objective of lower product sulfur specifications in accordance with patentee's disclosure (e.g., again see lines 6-14 and lines 38-43 in column 4).

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<sup>2</sup>In contrast to our above noted finding that the inventions of appellant and Fletcher share common objectives, the appellant argues that his claimed invention "is the exact opposite of what Fletcher does" (brief, page 5; emphasis deleted). This argument is without perceptible merit as explained by the examiner in the answer.

Moreover, as explained by the examiner and conceded by the appellant (e.g., see page 2 of the reply brief), Fletcher teaches that his light naphtha fraction may be desulfurized via a wet caustic wash as required by claim 11. Thus, the only remaining claim distinction in dispute on this appeal concerns the use of first and second hydrodesulfurization catalyst reactors as required by claim 11 rather than the use of first and second hydrodesulfurization catalyst beds in a single reactor as disclosed by Fletcher.

Regarding this claim distinction, it is the examiner's basic position that an artisan would have found it obvious to replace the first and second hydrodesulfurization catalyst beds of Fletcher's process with first and second hydrodesulfurization catalyst reactors. The appellant argues that the Fletcher reference contains no teaching or suggestion of using two catalyst reactors rather than two catalyst beds and that the proposed use of reactors would not be equivalent to patentee's use of beds.

In response to these arguments, we point out that Fletcher discloses the concept of multiple reactor use (e.g., see figure 1). Although patentee uses these multiple reactors for performing different catalytic reactions, the Fletcher patent

nevertheless evinces that it was known in the prior art to use multiple catalyst reactors as well multiple catalyst beds for performing various catalytic reactions under differing reaction conditions. In light of this evidence, we share the examiner's conclusion that it would have been obvious for an artisan to replace Fletcher's first and second hydrodesulfurization catalyst beds with first and second hydrodesulfurization catalyst reactors based on a reasonable expectation of successfully achieving the desired dehydrodesulfurization via a technique (i.e., the use of multiple catalyst reactors) known in the prior art (at least conceptually). See In re O'Farrell, 853 F.2d 894, 903, 7 USPQ2d 1673, 1681 (Fed. Cir. 1988). Furthermore, the artisan would have recognized that greater parameter manipulation and control would have been possible using separate catalyst reactors as opposed to multiple catalyst beds in a single reactor and accordingly would have been motivated to modify Fletcher's process in the manner proposed in order to obtain this advantage. Finally, while the appellant may be correct that first and second catalyst reactors would not be equivalent in all respects to first and second catalyst beds, an artisan would have recognized the former as being an acceptable alternate to the latter vis-à-vis achieving the hydrodesulfurization desired by Fletcher.


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Under these circumstances and for the reasons expressed in the answer, it is our ultimate determination that the examiner has established a prima facie case of obviousness which the appellant has failed to successfully rebut with argument or evidence of nonobviousness. See In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). We hereby sustain, therefore, the Section 103 rejection of all appealed claims as being unpatentable over Fletcher.


The decision of the examiner is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

  
BRADLEY R. GARRIS  
Administrative Patent Judge

  
CHARLES F. WARREN  
Administrative Patent Judge

  
CATHERINE TIMM  
Administrative Patent Judge

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KENNETH H. JOHNSON  
P.O. BOX 630708  
HOUSTON, TX 77263

BRG:hh